

A Coupled System for Predicting SPE Fluxes, Phase II

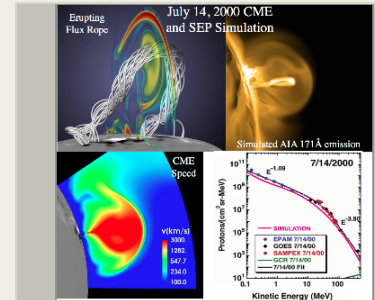
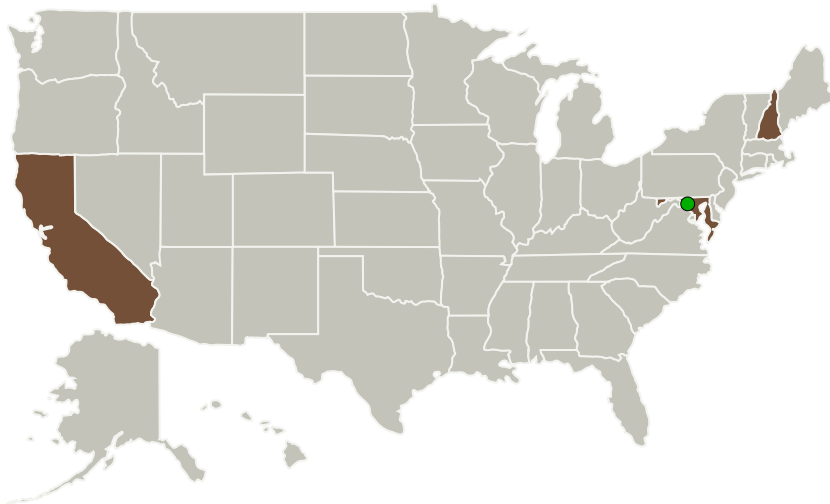
Completed Technology Project (2016 - 2019)



Project Introduction

Solar Particle Events (SPEs) represent a major hazard for extravehicular maneuvers by astronauts in Earth orbit, and for eventual manned interplanetary space travel. They can also harm aircraft avionics, communication and navigation. We propose to develop a system to aid forecasters in the prediction of such events, and in the identification/lengthening of "all clear" time periods when there is a low probability of such events occurring. The system leverages three recently developed technologies: physics-based models of the solar corona and inner heliosphere, robust CME modeling techniques, and empirical/physics-based assessments of energetic particle fluxes using the Earth-Moon-Mars Radiation Environment Module (EMMREM, University of New Hampshire). When completed, the proposed SPE Threat Assessment Tool, or STAT, will represent a significant step forward in our ability to assess the possible impact of SPE events.

Primary U.S. Work Locations and Key Partners



A Coupled System for Predicting SPE Fluxes, Phase II

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Organizational Responsibility	2
Project Management	2
Images	3
Technology Maturity (TRL)	3
Technology Areas	3
Target Destinations	3

A Coupled System for Predicting SPE Fluxes, Phase II

Completed Technology Project (2016 - 2019)



Organizations Performing Work	Role	Type	Location
Predictive Science, Inc.	Lead Organization	Industry	San Diego, California
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland
University of New Hampshire-Main Campus	Supporting Organization	Academia	Durham, New Hampshire

Primary U.S. Work Locations

California	Maryland
New Hampshire	

Project Transitions

▶ **September 2016:** Project Start

✓ **September 2019:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140798>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Predictive Science, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Jonathan Linker

Co-Investigator:

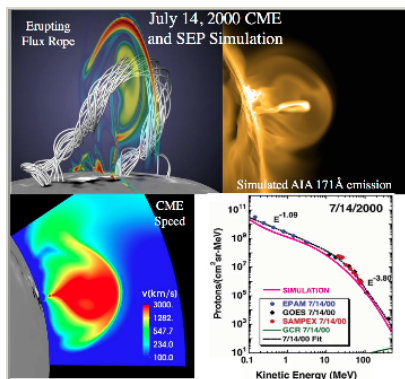
Jon Linker

A Coupled System for Predicting SPE Fluxes, Phase II

Completed Technology Project (2016 - 2019)



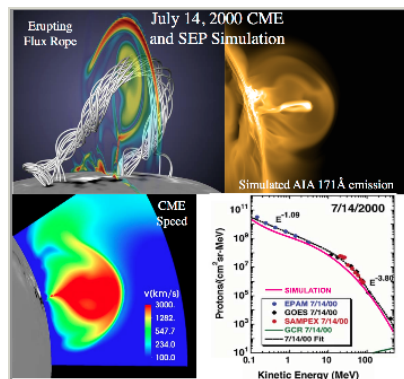
Images



Briefing Chart Image

A Coupled System for Predicting
SPE Fluxes, Phase II

(<https://techport.nasa.gov/image/126390>)



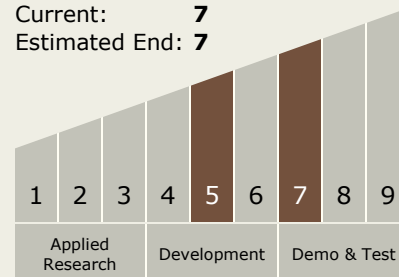
Final Summary Chart Image

A Coupled System for Predicting
SPE Fluxes, Phase II

(<https://techport.nasa.gov/image/125927>)

Technology Maturity (TRL)

Start: 5
Current: 7
Estimated End: 7



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - TX06.5 Radiation
 - TX06.5.4 Space Weather Prediction

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System